

WHAT IS CLAIMED IS:

1 1. An optical apparatus for directing first and second laser sources to a
2 media, then directing reflected light to a detector, the improvement comprising:

3 a single detector for detecting reflected light from both of said laser sources;
4 and

5 a grating having a surface configured to diffract reflected light from said first
6 laser source to said detector, and allowing reflected light from said second laser source to
7 pass directly to said detector without diffraction.

1 2. The apparatus of claim 1 wherein said surface includes:
2 a first surface with a grating for diffracting reflected light from said first laser
3 source, and a second surface without a grating for allowing reflected light from said second
4 laser source to pass without diffraction.

1 3. The apparatus of claim 1 wherein said surface includes:
2 a grating having a pattern configured to diffract reflected light of the
3 wavelength of said first laser source, and allow reflected light of the wavelength of said
4 second laser source to pass without diffraction.

1 4. The apparatus of claim 1 wherein said optical apparatus includes:
2 a beam splitter positioned to split the light from the laser sources and the
3 reflected light so that the laser sources and the detector can be mounted at an angle to each
4 other.

1 5. The apparatus of claim 1, wherein said optical apparatus includes:
2 a 3-beam grating positioned to split the light from each of said laser sources
3 into 3 beams before contacting said media.

1 6. The apparatus of claim 1, wherein said optical apparatus includes:
2 a collimating lens positioned between said laser sources and said medium; and
3 an objective lens positioned between said collimating lens and said medium.

1 7. The apparatus of claim 6, wherein said laser sources have different
2 wavelengths, and an optical axis of each of said laser sources, at a point of entering said
3 objective lens, is parallel to an axis of said objective lens.

1 8. The apparatus of claim 1 wherein said detector is a four element
2 detector.

1 9. The apparatus of claim 8, wherein said detector is on a chip having a
2 second detector positioned to collect light from other orders of the diffracted reflected light
3 from said first laser and a circuit for combining a signal from said second detector with a
4 signal from said detector for said first laser.

1 10. An optical apparatus for directing first and second laser sources to a
2 media, then directing reflected light to a detector, the improvement comprising:

3 a 3-beam grating positioned to split the light from each of said laser sources
4 into 3 beams before contacting said media;

5 a beam splitter positioned to split the light from the laser sources and the
6 reflected light so that the laser sources and the detector can be mounted at an angle to each
7 other;

8 a collimating lens positioned between said laser sources and said medium;
9 an objective lens positioned between said collimating lens and said medium.

10 wherein said laser sources have different wavelengths, and an optical axis of
11 each of said laser sources, at a point of entering said objective lens, is parallel to an axis of
12 said objective lens;

13 a single four element detector for detecting reflected light from both of said
14 laser sources; and

15 a grating having a first surface with a grating configured to diffract reflected
16 light from said first laser source to said detector, and having a non grating surface for
17 allowing reflected light from said second laser source to pass directly to said detector without
18 diffraction.

1 11. An improved method for directing first and second laser sources to a
2 media, then directing reflected light to a detector, the improvement comprising:

3 providing a single detector for detecting reflected light from both of said laser
4 sources; and

5 diffracting reflected light from said first laser source to said detector, and
6 allowing reflected light from said second laser source to pass directly to said detector without
7 diffraction.

1 12. The method of claim 11 further comprising:
2 determining a separation of said laser sources; and
3 varying a distance of a diffraction grating from said detector to direct reflected
4 light with said separation to said detector.

1 13. The method of claim 11 further comprising:
2 determining a separation of said laser sources; and
3 forming a diffraction pattern to direct reflected light with said separation to
4 said detector.